

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets



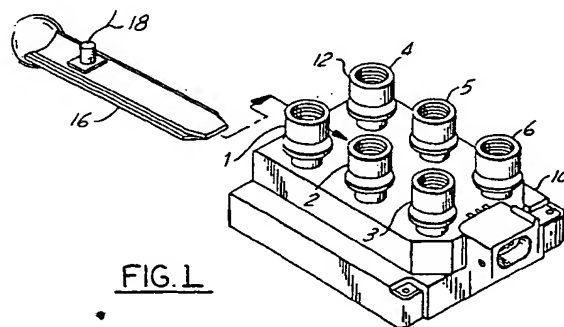
(11) Publication number:

0 602 803 A3

(12)

EUROPEAN PATENT APPLICATION(21) Application number: **93309269.4**(51) Int. Cl.⁵: **F02P 15/08, F02P 15/00,
F02P 17/00, G01R 31/00,
F02P 7/03**(22) Date of filing: **22.11.93**(30) Priority: **15.12.92 US 991027**(43) Date of publication of application:
22.06.94 Bulletin 94/25(84) Designated Contracting States:
DE FR GB(86) Date of deferred publication of the search report:
19.10.94 Bulletin 94/42(71) Applicant: **FORD MOTOR COMPANY LIMITED**
Eagle Way
Brentwood Essex (GB)(84) **GB**(71) Applicant: **FORD-WERKE**
AKTIENGESELLSCHAFT
Werk Köln-Niehl,
Henry Ford Strasse,**Postfach 60 04 02**
D-50735 Köln (DE)(84) **DE**(71) Applicant: **FORD FRANCE S. A.**
B.P. 307
F-92506 Rueil-Malmaison Cédex (FR)
(84) **FR**(72) Inventor: **James, John Victor**
4301 Arbour Drive
Walled Lake, Michigan 48390 (US)
Inventor: **Dosdall, James Michael**
27187 West River Road
Grosse Ile, Michigan 48138 (US)(74) Representative: **Messulam, Alec Moses et al**
A. Messulam & Co.
24 Broadway
Leigh on Sea Essex SS9 1BN (GB)(54) **Cylinder number identification on a distributorless ignition system engine lacking CID using a single secondary voltage sensor.**

(57) An apparatus for identifying the power stroke of a particular cylinder in a multi-cylinder engine which utilises a wasted spark electronic distributorless ignition system but lacks a camshaft driven cylinder identification sensor, wherein a single sensor (16,17) can be placed in a coil pack (10) adjacent to and substantially equidistant from the ignition coil towers (12). The sensor (16,17) will produce a signal (102) reflecting the difference in voltage drops between corresponding pairs of spark plugs (A,B) who share the same coil and which utilises this signal to determine the power stroke of individual cylinders to produce a resulting synthetic cylinder identification signal. This apparatus can further be used as a permanent on-board sensor, thereby negating the need for a separate camshaft driven sensor, to determine the cylinder identification.

**FIG. 1****EP 0 602 803 A3**



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 30 9269

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CLS)
A	US-A-4 795 979 (KREFT ET AL) * the whole document * ---	1-3,6, 13,17	F02P15/08 F02P15/00 F02P17/00 G01R31/00
A	US-A-4 847 563 (SNIEGOWSKI ET AL) * column 10, line 8 - column 13, line 32; figure 11 * ---	1,2,4, 6-8,13, 17	
A	DE-A-40 28 554 (ROBERT BOSCH GMBH) * column 3, line 1 - line 20; figure 2 * ---	1,6,12, 13,17	
A	DE-C-40 18 895 (ROBERT BOSCH GMBH) * column 3, line 28 - line 60; figure * ---	1,6,12, 13,16,17	
A	EP-A-0 508 804 (NGK SPARK PLUG CO LTD) * figures 6,7 * -----	9-11,14, 15,18	
			TECHNICAL FIELDS SEARCHED (Int.Cl.5)
			F02P G01R
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25 August 1994	Examiner Michels, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons & : member of the same patent family, corresponding document	

EPO FORM 1503 01.92 (P04C01)